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BRIEF ARTICLES

COMMUNICATION IN INTERPERSONAL BARGAINING

ROBERT M. KRAUSS AND MORTON DEUTSCH[1]

Bell Telephone Laboratories, Incorporated
Murray Hill, New Jersey

Teachers College
Columbia University

The results of 2 experiments employing a 2-person bargaining game with bilateral threat are reported. In the 1st, ½ the Ss were tutored in communicating fair proposals, and ½ were not so tutored. Ss achieved significantly higher joint payoffs when tutored. The 2nd experiment varied the time period during which pretrial communication was permitted: either before trials 1 through 7 or before trials 8 through 14. Communication occurring before the early trials was considered to be predeadlock; communication initiated only after the 1st 7 trials was considered to be postdeadlock. Joint payoffs were higher when communication was initiated postdeadlock.

It is a common belief that communication between parties in conflict will reduce their conflict. Of course, it is true that conflict can seldom be reduced in the absence of communication. However, this should not be taken to imply that communication will perforce lead to conflict resolution. Conflicting parties can communicate threats as well as offers of conciliation, and communication can, under certain conditions, serve to intensify conflict instead of ameliorating it.

In a previous study (Deutsch & Krauss, 1960), it was shown that the availability of a means of threat made it more difficult for subjects to arrive at mutually satisfactory agreements in a bargaining game. Pairs of subjects played the game under conditions of no threat, unilateral threat, or bilateral threat. Their ability to reach agreements, as reflected by the magnitude of their joint payoffs, was inversely related to the amount of threat present. In that experiment, subjects were not permitted to communicate verbally; however, in two further experiments (Deutsch & Krauss, 1962) this restriction was not present. In the first, subjects were allowed to use an intercom to communicate, if and when they wished; this procedure was referred to as permissive communication. Subjects in this experiment talked infrequently and performed no differently from those who lacked access to a communication channel. It seems clear then that the opportunity to converse, per se, does not necessarily lead to the reduction of conflict; the opportunity may not be utilized.

Because of the low rate at which subjects communicated, a third experiment was run in which subjects were compelled to talk to each other (Deutsch & Krauss, 1962). Under this condition (which was termed compulsory communication) an effect of communication was observed. Subjects in the unilateral threat condition achieved higher payoffs with compulsory communication than with no communication or with permissive communication. However, performance under bilateral threat was no different across the three communication conditions. These findings were interpreted as supporting the hypothesis that the outcome of a bargaining encounter depends upon the balance of cooperative and competitive motivations acting upon the participants. Under bilateral threat, the competitive motivations which are present so overbalance cooperation that communication tends largely to center about the exchange of threat. In the unilateral threat conditions, the balance of cooperative to competitive motivations is such that compulsory communication can affect the bargainers' ability to reach agreements. This is consistent with the findings of Deutsch (1960) that communication increased the cooperativeness of individualistically oriented subjects, but not of subjects who were competitively oriented.

In the two bargaining experiments described above, communication took place simultaneously with the subjects' interaction on the bargaining problem. Such a procedure may have the effect of focusing the subjects' attention on the more imminent and local problems of their interaction, and lead them to devote less time to discuss the more fundamental issues which underlie their conflict of interest. In addition, because their payoffs were determined by the time it took to complete the bargaining problem, subjects may have felt some pressure to restrict their communication in order not to incur a penalty for losing time. These circumstances may have combined to diminish the usefulness of communication. For these reasons in the present study some procedures involving communications were examined which took place *prior to* the bargaining itself.

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[1] The experiments reported here were conducted while the second author was at the Bell Telephone Laboratories. The assistance of L. B. Berenson, who performed most of the statistical analysis, is gratefully acknowledged.

Our previous studies suggested quite strongly that the mere existence of a communication channel would not guarantee its effective utilization, even when subjects were compelled to use it. This reasoning led us to compare the effects of two orientations to communication. One orientation (Untutored Pretrial Communication—UPC) stressed the importance of communicating, but did not attempt to specify the content of the communication. The other (Tutored Pretrial Communication—TPC) instructed the subjects to center their discussion about negotiating a fair solution to the bargaining problems.

Another aspect of communication in bargaining seems worthy of note. Bargainers can negotiate agreements which specify a principle for the resolution of the conflict or which are ad hoc, that is, applicable only to a particular case or instance. It is to be expected that ad hoc agreements are critically dependent upon the availability of communication, while general agreements, because of the broader applicability of the principle they specify, are not so dependent. We attempted to examine this factor by manipulating the *future perspective* of our subjects. The specific induction is described below under the description of method.

As is noted above, in our previous studies the bilateral threat condition was found to be the most difficult in which to achieve conflict resolution. For this reason we decided to focus our attention on this condition, and in the experiments to be reported here all subjects bargained under bilateral threat.

EXPERIMENT I

Method

Subjects. Seventy-six experimentally naive female clerical employees of the Bell Telephone Laboratories served as subjects.[2] Their ages ranged from 18 to 32 years. All were high school graduates. Subjects were assigned randomly to their treatments, with the restriction that the members of a pair had to come from different offices. This was necessary to prevent a subject from discovering her partner's identity. To further insure anonymity, their arrival times were staggered by about 5 minutes. Subjects were volunteers and participated during their regular working hours.

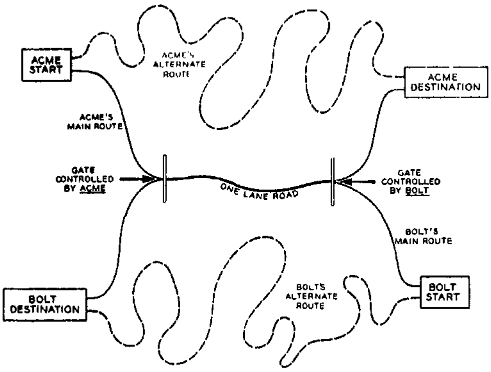

FIG. 1. A subject's "road map."

Experimental task. The experimental task consisted of a two-person electromechanical bargaining game. The apparatus has been described in detail in previous publications (Deutsch & Krauss, 1960, 1962; Krauss, 1964) and will only be briefly referred to here. In the game, the participants play the roles of owners-drivers of trucking firms which carry merchandise over a road from a starting point to a destination. Their profits (paid in imaginary money) are based on the time it takes them to complete a trip—the shorter the time, the greater their profit. If they take too long, they can lose money. Their routes are illustrated in Figure 1. One player (Acme) travels from the left to the right, the other (Bolt) from right to left. One section of their main route is common to both—the middle segment labeled "One Lane Road." This section is only wide enough for one truck to go through at a time. Thus, in order to use the main routes efficiently the players must work out some method of sharing the one-lane section. Of course, the player who is the first to go through the one-lane section ends up with the greater profits, since this player is able to complete his trip in less time. As the road map indicates, there is another way for the players to reach their destinations, the alternate route. However, its length is such that its use necessarily means that the player must sustain a loss on that trial. Each player also has control of a gate, which can prevent the other player from passing that point on the main route. The use of these gates constitutes the exercise of threat discussed above. Subjects played the game for a total of 20 trials.

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[2] We wish to thank the Area Management staff of the Bell Laboratories, Whippany, New Jersey, location, for their cooperation in providing facilities and subjects for this experiment. The assistance of E. J. Frith who supervised the recruitment and scheduling of subjects was especially helpful.

TABLE 1

ANALYSIS OF VARIANCE OF TRANSFORMED PAYOFFS

Source	*MS*	*F*
Communication orientation (A)	141.49	7.04**
Future perspective (B)	56.13	2.79
A × B	0.06	<1
Error (*S*s within cells)	20.09	
Trial blocks (C)	5.61	1.94
A × C	8.29	2.85
B × C	1.01	<1
A × B × C	1.59	<1
Error (*S*s × C within cells)	2.89	
Total		

** $p < .025$, $df = 1/34$.

Each subject was equipped with a headset (earphones and microphone) hooked into an intercom system. A filter, built into the intercom's amplifier, distorted voice quality sufficiently to make it unlikely that subjects would recognize one another's voices, even if they were previously acquainted. Intelligibility, however, was not significantly impaired.

Procedure. Subjects arrived separately and were seated so that both subjects could see the experimenter but not each other. They were assured that the experiment had no connection with their jobs and that their results would be kept confidential. The experimenter then played tape-recorded instructions for the bargaining game. After the instructions, the experimenter took the subjects through a series of practice trials. The instructions and the practice routine are the same as have been employed in previous experiments (Deutsch & Krauss, 1960, 1962). Following the practice trials, the instructions which established the communication orientation were administered. Subjects in the UPC condition were told that they would be required to talk to each other before each trial. They were told that they could talk about anything they wanted to, but that it would be necessary that they say *something* to each other before every trial.

Subjects in the TPC condition were also told that they must communicate before each trial; however, their instructions specified the content of pretrial communication. They were told to use this opportunity to make a proposal to the other player about what they would do on the forthcoming trial. Moreover, they were instructed to try to make proposals which were fair, both to themselves and to the other player. (". . . make a proposal which you think is reasonable and acceptable both to yourself and to the other person. Try to make a proposal which is both fair to yourself and which you would be willing to accept if you were in her shoes.")

After these instructions, subjects proceeded to play the bargaining game, communicating before the start of each trial. After each trial, the experimenter announced the amount won or lost by each subject so that both could hear it. Though they were not aware that this was to be the case, our procedure called for pretrial communication before trials 1 through 7 only. Prior to the seventh trial, subjects in the No Future Perspective (NFP) condition were simply told that this was to be the last time they could talk *before* the trial, although they would still be allowed to talk *during* it. Subjects in the Future Perspective (FP) condition were told in addition that they could, if they wished, use this final opportunity to discuss future trips, as well as the one immediately to follow. On all 20 trials subjects were permitted to communicate during, but not prior to, the trial.

Nine pairs of subjects were run in each of the UPC conditions (UPC-FP and UPC-NFP) and 10 pairs in each of the TPC conditions (TCP-FP and TPC-NFP).

RESULTS

The subjects' joint payoff was taken as the measure of their ability to conclude bargaining agreements. Because of skewness in the distribution of payoffs, a square-root transformation, $\sqrt{(k-x)}$, was applied to all scores: where x is the original raw score and k is the largest possible score plus 1. An analysis of variance of these values was performed, with the transformed payoffs collapsed into three trial blocks: trials 1 through 7, 8 through 14, and 15 through 20. The result of this analysis is shown in Table 1. A significant main effect is obtained for communication orientation; subjects in the TPC condition, who were trained to communicate fair proposals, achieve significantly better payoffs than do subjects in the UPC treatment. Neither the effect of the future perspective manipulation nor the interactions are significant.

Our speculation had been that the agreements which were reached under TPC might erode when the opportunity for pretrial communication was withdrawn, due either to the minor harassments of inadequate coordination or to adventurism on the part of one or the other player. However, the agreements apparently were sufficiently stable to be maintained over a series of subsequent trials. It seems likely that, given the simplicity of the bargaining situation, communication *during* the trial (which was permitted) enabled the players to handle such potentially erosive effects. With a more complex bargaining situation, or with greater restriction on communication, our speculations might have some merit.

The mean transformed values for the two communication orientations in three trial blocks are plotted in Figure 2. In addition, we have plotted values for the permissive communication-bilateral threat condition taken from a previous experiment (Deutsch & Krauss, 1962) and appropriately transformed.[8] Although TPC pairs end up with a positive joint outcome (untransformed) which averaged $.50 for the 20 trials, which is significantly better than the average *loss* of $8.26 in the permissive communication condition, the difference between UPC and permissive communication is not statistically significant. Thus, the requirement that subjects communicate before the trial began did not result in a significant improvement in bargaining outcomes unless subjects also received tutoring.

EXPERIMENT II

The results of Experiment I indicate that subjects who have been induced to communicate fair proposals can resolve a good part of the conflict of interest implicit in the bargaining situation. Our next experiment was directed at determining if the effectiveness of pretrial communication is affected by the period of time in which the communication occurs. That is, is there a difference between the effectiveness of communication introduced at the very beginning of the game (before the subjects have had any experience together) and communication which is introduced after the subjects had played the game for several trials?

Two possibilities occurred to us. First, it could be argued that subjects who played the game under bilateral threat and experienced the customary sequence of deadlock and retaliation would develop mutually negative attitudes. These attitudes, once developed, would impose barriers to communication when the opportunity to communicate was later introduced. On the other hand, it could be argued that the experience of unsuccessful outcomes would make subjects more receptive to innovations which have some potential for conflict resolution. That is to say, knowing how bad things can get without communication, they might be more likely to make effective use of a communication channel when the opportunity presented itself.

Method

Based on our prior experiments with the bilateral threat condition, it was reasonable to expect that subjects would routinely be using their gates by the seventh trial. Thus, we were able to set up a postdeadlock communication condition by permitting pretrial discussion on trials 8 through 14, but not on trials 1 through 7. We ran 10 new pairs of subjects under Postdeadlock-UPC and 10 pairs under Postdeadlock-TPC. Both groups ran under the FP treatment. In all other respects the procedure of Experiment I was paralleled. Again, on all trials communication was permitted during the trial.

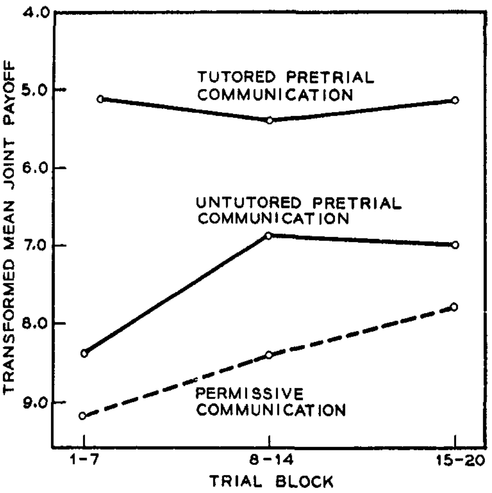

FIG. 2. Transformed mean joint payoff in the three trial blocks (the lower the value of the transformed payoff, the better the outcome for the players).

Results obtained from these treatments will be contrasted in our analyses with those obtained in Experiment I. It will be remembered that in the earlier experiment pretrial communication was permitted on trials 1 through 7 only, and, hence, subjects in this experiment may be thought of as having undergone predeadlock communication. Thus, our analysis will consist of four treatment conditions: Predeadlock-TPC-FP, Predeadlock-UPC-FP, Postdeadlock-TPC-FP, Postdeadlock-UPC-FP.

RESULTS

An analysis of variance of transformed joint payoffs, summed over the seven trials on which pretrial communication took place[4] is shown in Table 2. (For the predeadlock conditions these are trials 1 through 7 and for the postdeadlock condition, trials 8 through 14.) The means for the three trial blocks (trials 1 through 7, 8 through 14, and 15 through 20) and for the different experimental conditions appear in Table

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[8] Subjects in that experiment were in all respects comparable to those used in the present one. As is noted above, subjects in the permissive communication conditions, like subjects in the present experiment, were allowed, but not compelled, to communicate during the trial. Hence, any differences between the outcomes for those subjects and the present ones may be attributed to the availability of pretrial communication.

[4] For subjects in the predeadlock conditions, this was trials 1 through 7; in the postdeadlock conditions, it was trials 8 through 14.

TABLE 2

ANALYSIS OF VARIANCE OF MEAN TRANSFORMED JOINT PAYOFF ON SEVEN TRIALS ON WHICH PRETRIAL COMMUNICATION WAS PERMITTED

Source	*MS*	*F*
Communication orientation (A)	24.034	3.759*
Pre- or postdeadlock (B)	21.889	3.434*
A × B	15.047	2.354
Within cells	6.393	

* .05 < p < .10, df = 1/36.

3. Postdeadlock communication proves more effective than predeadlock communication. And, as in Experiment I, there is an overall superiority of tutored versus untutored communication. However, it should be noted that the effectiveness of untutored communication is enhanced by the postdeadlock procedure. The average payoff under postdeadlock is almost as good as under postdeadlock-TPC for these seven trials.

But it can be contended that these results are misleading. The payoffs in the postdeadlock conditions are from trials 8 through 14, while the predeadlock payoffs are from trials 1 through 7. It is possible that subjects in the postdeadlock treatments have simply developed greater skill in the game because they had more practice than subjects in the predeadlock condition. However, for all subjects, in both the pre- and postdeadlock treatments, no pretrial communication was permitted on trials 15 through 20. Hence, group differences in performance on these trials must reflect the effects of prior experimental inductions. In addition, all subjects have had equivalent amounts of practice in this trial block. The results of an analysis of variance of summed joint payoff on trials 15 through 20 (termed the "criterion" trials) is shown in Table 4; the means for this trial block appear in Table 3. It is still clear that postdeadlock communication produces better outcomes than the predeadlock communication. Similarly, outcomes under TPC are greater than under UPC. Once again it is noted that the effectiveness of untutored communication is greatly enhanced by the postdeadlock procedure: on the six criterion trials subjects in postdeadlock-UPC do slightly better than those in predeadlock-TPC. However, the improvement in outcomes from the initial to the final block of trials is markedly better in the postdeadlock conditions for the pairs who were tutored as compared with those not tutored in how to communicate ($p < .001$).

TABLE 3

TRANSFORMED MEAN JOINT PAYOFFS (ACME AND BOLT) UNDER DIFFERENT COMMUNICATION CONDITIONS IN BILATERAL THREAT SITUATION[a]

	Tutored and untutored communication combined		
	Trials 1 through 7	Trials 8 through 14	Trials 15 through 20
Predeadlock	6.216	5.318	5.376
Postdeadlock	7.763	4.450	3.656
	Tutored communication		
Predeadlock	4.719	4.609	4.178
Postdeadlock	8.778	4.256	3.213
	Untutored communication		
Predeadlock	7.713	6.027	6.573
Postdeadlock	6.747	4.644	4.099

[a] Payoffs have been transformed so that $x' = \sqrt{k-x}$, with k equal to the highest score in any single analysis plus 1·0; x is the untransformed score. The lower the score, the better the outcome for the players.

TABLE 4

ANALYSIS OF VARIANCE OF MEAN TRANSFORMED JOINT PAYOFF ON SIX CRITERION TRIALS

Source	*MS*	*F*
Communication orientation (A)	26.921	2.898*
Pre- or postdeadlock (B)	29.558	3.182*
A × B	5.700	<1
Within cells	9.288	

* .05 < p < .10, df = 1/36.

DISCUSSION

It seems clear that communication which takes place prior to bargaining is no more effective than communication which goes on during bargaining in leading to a resolution of the bargainers' conflict. It is not the reduction of the pressure of time on communication but rather the provision of a strong incentive to utilize the opportunity to communicate to engage in fair bargaining which is central to the economical resolution of conflict.

It is clear that the incentive to make fair proposals derived from the instructions of the experimenter in the tutored communication condition. When the experimenter, a figure not without prestige and authority for the subjects, instructs them to use the communication channel to exchange fair proposals, he is doing more than simply suggesting the content of communication. He is, in effect, establishing a social norm of "fairness" or "equity" as part of the context of the experiment. For a subject in these circumstances to attempt to secure more than his fair share violates the cultural standard of reasonable or sportsmanlike behavior. But when no such restrictions are present, as in the UPC conditions, the subject is free to respond to the competitive aspects of the bargaining situation, and this is reflected in his communication behavior as well as in his bargaining.

Why, then, does untutored communication treatment prove effective in the postdeadlock condition, when it had so negligible an effect with the predeadlock procedure? To begin with, subjects in the postdeadlock condition have experienced the frustrating and unproductive course of events typical of behavior under bilateral threat. Presumably such experience served as an incentive for them to seek some means of resolving their conflict. But experience by itself is not enough. It must be supplemented by some strong prod to reconsider the situation. This was implicit in the experimenter's action of interrupting the progress of the game and giving the subjects an opportunity to communicate before the trial. We assume that the experimenter's intervention was interpreted by the subjects as both a pressure and opportunity to improve their bargaining outcomes. But it is also clear that where the lessons of experience are drawn explicitly for the subjects, they are utilized more aptly.

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ACHIEVEMENT MOTIVATION, ACHIEVEMENT, AND PSYCHOLOGICAL TIME[1]

ROBERT D. MEADE
Western Washington State College

40 male college students who made high scores on the n Achievement Test described by McClelland, Atkinson, Clark, and Lowell (1953) and 40 who scored low on the same test worked on a task at 2 different rates for 15 min. Ss were required to estimate the time spent on the task in comparison to a standard period of time working on a paper-and-pencil test of achievement. The results showed a greater variation in high need achievers' estimates between the 2 progress conditions than for those who were low need achievers. It is suggested that the results support the general description of high and low need achievers—the high need achievers being more concerned with progress and the value of time.

Experimental investigations which use time estimates as their dependent variables are often complicated by the relatively high degree of variability which their data show. Woodrow (1951) and Fraisse (1963), reviewing experiments on psychological time, point out that such variability is a distinguishing feature of these studies.

Meade (1959, 1960a, 1960b, 1963) has shown that motivational factors affect psychological time and that their control can also decrease variability of time-estimation data. However, little attention has been given to motivational factors that are a more permanent aspect of the personality.

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